

**NONINVASIVE OPTICAL METHOD AND SYSTEM
FOR INSPECTING OR TESTING CMOS CIRCUITS**

ABSTRACT

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A method and system for testing an integrated circuit. The method comprises the steps of obtaining periodic optical emissions over a defined period of time and from a defined area of an integrated circuit operating with time-varying internal currents, and time resolving said emissions by photon timing to estimate the number of switching events occurring in said defined area over said defined period. The method further comprises the steps of providing an optical emission model, and comparing the optical emissions from the area of the integrated circuit with the optical emission model to determine whether any of a group of defined conditions are present on the integrated circuit. For example, this test may be used to detect local power supply loading under high power density operation, or to derive changes in mobility due to heating effects.

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